

GRAPHTEC

DM3100 Solutions

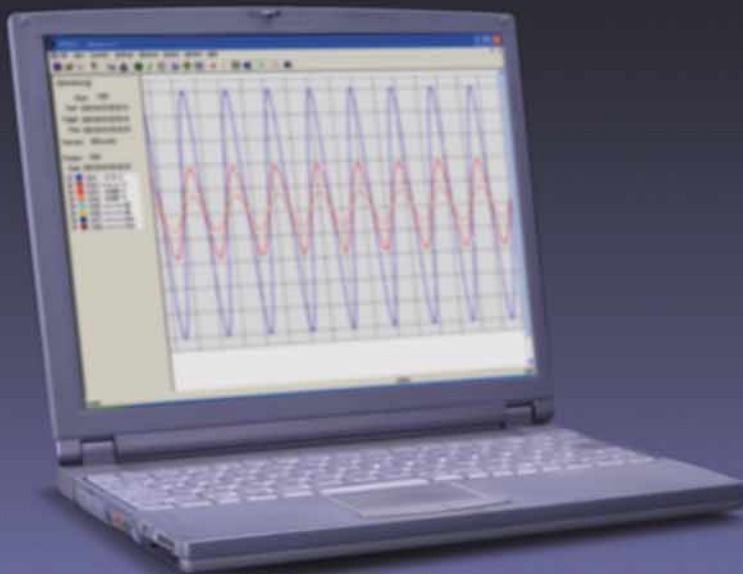
Application-specific Portable Data Capture Systems
built on the DM3100 Data Platform

PC
Measurement
Made Easy!

Digital
Oscilloscope
DM Style!

PC-based
Data Logger
Fast & Furious

Data Recorder
& Logger
Like No Other



The New Concept DM3100, at the Heart of all the DPM System Configurations

The DM3100 Series Data Platform is a new type of measurement device that combines the superior advantages of computer-based measurement with those of a standalone device. It offers features such as plug-in amps with high noise resistance, the use of synchronous input/output cables to enable multi-channel measurement synchronized on the time axis, data storage functions to accurately capture important data, and networkability to meet various user needs in a wide range of measurement scenarios.

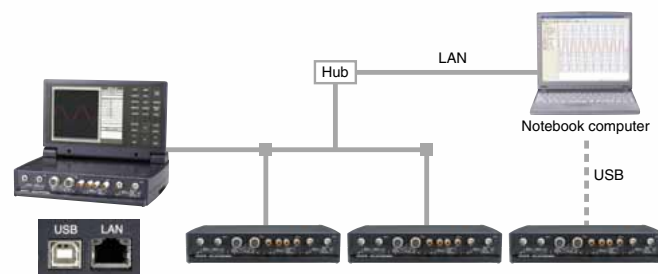
DATA PLATFORM MANAGEMENT

DM
Solutions

Request 1 Easy Measurement Using a PC

Make Use of Ethernet and USB Connectivity

Ethernet LAN connectivity enables remote operation and data measurement, while USB connectivity facilitates measurement setups.



Request 2 Increased Number of Measurement Points

Synchronous Linking for Multi-channel Operation

Up to 8 DM units can be linked together with synchronous data input/output cables for synchronized measurement on the time axis on up to 64 channels. Each unit is connected via Ethernet or USB, and controlled by the PC. (Synchronous linking can only be performed when the PC is used as a controller).



8-channel model (4 slots/model): Up to 8 platforms can be connected

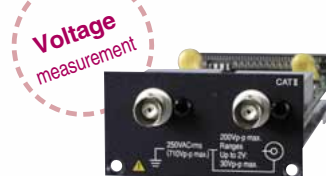


16-channel model (8 slots/model): Up to 4 platforms can be connected

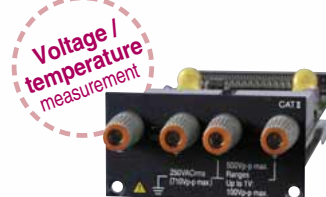


Request 3 Ability to Capture Different Measurement Phenomena

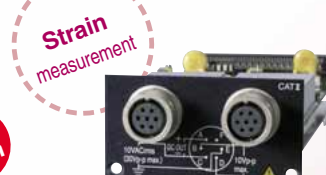
A Wide Range of Isolated Plug-in Amplifiers to Suit Your Application Needs



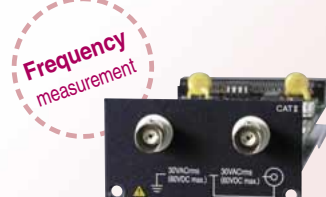
DM3-V amplifier
1 MS/s max sampling speed,
50 mV to 200 V input voltage



DM3-M amplifier
Direct thermocouple
input, 100 kS/s max
sampling speed,
20 mV to 500 V input
voltage



DM3-DCB amplifier
Direct input from strain gauge
sensors, DC to 20 kHz
frequency response, 1000 to
20000 x 10⁻⁶ strain



DM3-FV amplifier
200 Hz to 40 kHz measurement
range

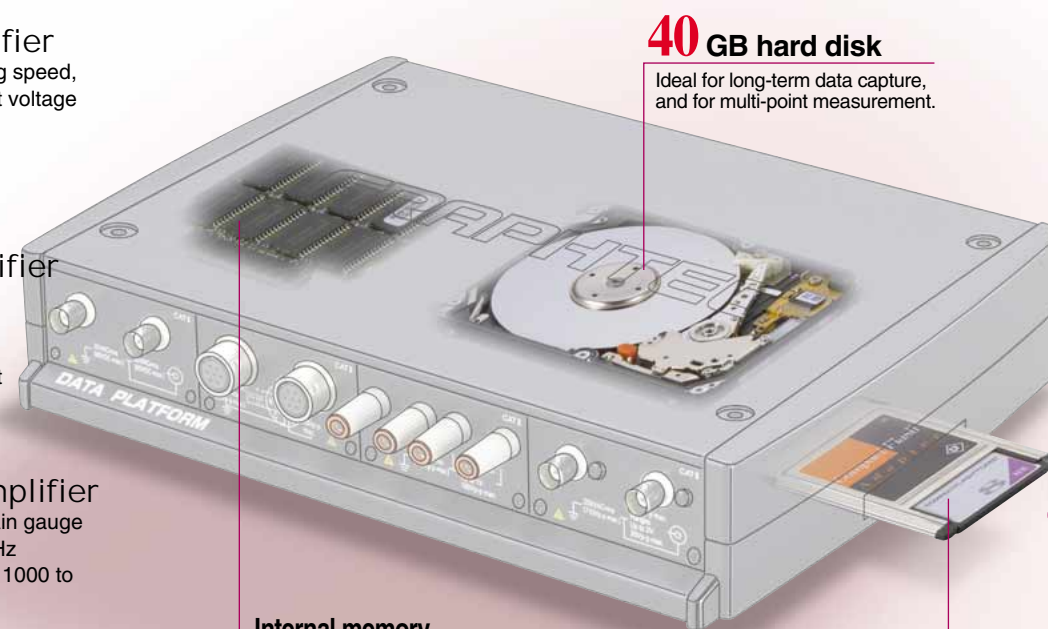


B-503 amplifier
TTL, CMOS High/Low signal
input or Contact Closure

Request 4 Long-term Data Capture

Choice of Memory Devices for Reliable Data Capture

Data is captured directly to the DM3100's internal memory devices. Select the data storage device that best suits your application.



40 GB hard disk
Ideal for long-term data capture,
and for multi-point measurement.

Internal memory
512 kwords/ch
(option: 1 Mword/ch)

Ideal for capturing high-speed events
and for use in environments where there
are vibrations.

PCMCIA card*1

Enables off-line transfer of data
captured by the DM3100 to your PC.
In addition, data can be captured
directly to the PCMCIA card.

*1 Please consult your Graphtec
distributor for the types of PCMCIA
cards that can be used.

Measurement data capture times

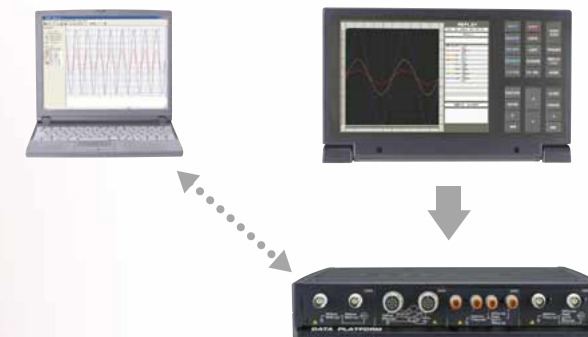
	1 μ s	10 μ s	20 μ s	100 μ s	500 μ s	1 ms	5 ms	10 ms	100 ms	1 s	5 s
512 kwords/ch (standard)	0.512 s	5.12 s	10.24 s	51.2 s	4.2 min	8.5 min	42.5 min	1.4 h	1.42 h	5.9 days	29 days
1 Mword/ch*2	1.24 s	12.4 s	24.8 s	2 min	10 min	20 min	1.4 h	3.4 h	1.4 days	14 days	71 days
HDD (1 file = 2 GB)*3	2.08 min	20.8 min	41.6 min	3.4 h	17.3 h	1.4 days	7 days	14 days	144 days	1446 days	7233 days
PCMCIA card (340 MB)							30 h	2.5 days	24.6 days	245 days	1229 days

*2 Option *3 One data capture operation is up to 2 GB

Request 5 On-site Standalone Measurement Without Using a PC

Attach the Monitor to Turn Your DM3100 into a Standalone Model

This is the perfect solution for those times when you don't want to take your PC to the measurement site, or when you don't need to use your PC for measurement. The standalone model is light and easy to carry.



Request 6 Quick and Easy Report Creation

Convenient Tool to Help You with Report Creation

Use the optional report creation software to enable you to convert the waveforms and measurement conditions displayed on your controller PC screen to BMP and WMF file formats, and then paste them into Excel® and Word® documents to easily create reports. In addition, the software has other built-in functions to enable conversion to CSV, TEXT, and DADiSP® formats.



File pasted into Excel



Printout

DM3100

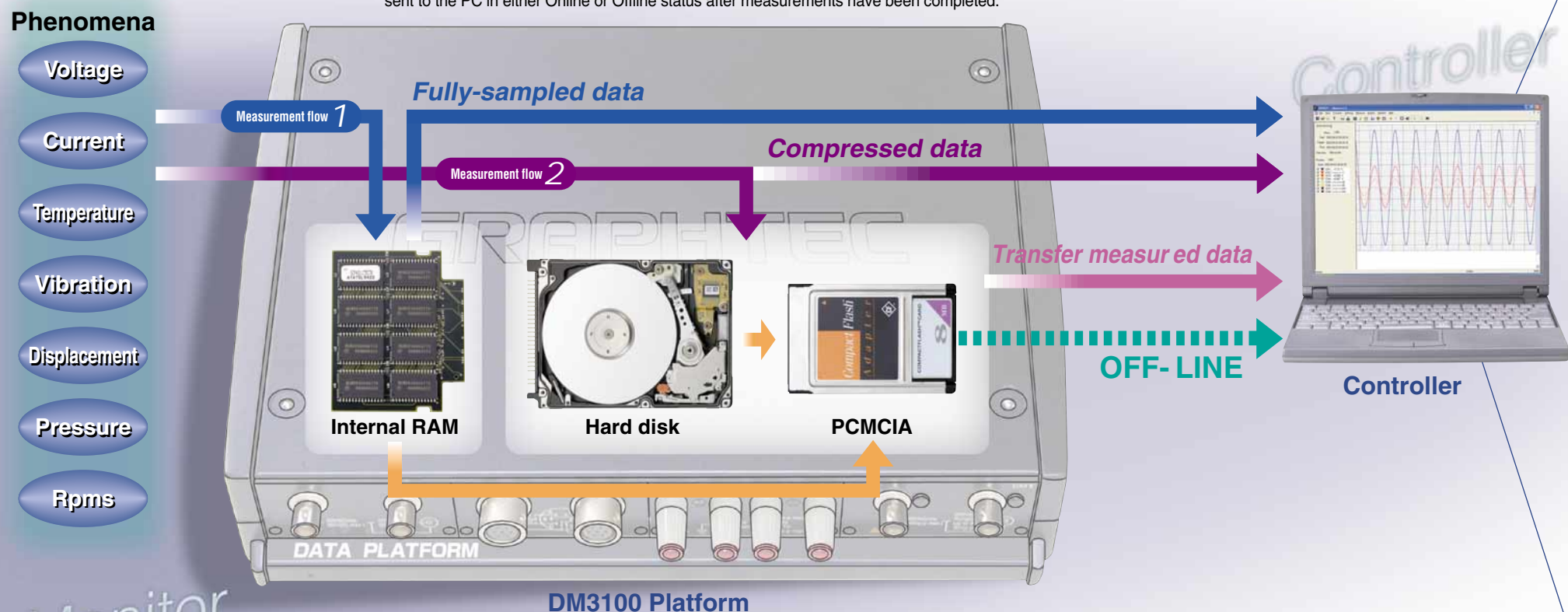
A PC Measurement Device to Accurately Measure, Capture and Display Data

The DM3100 Data Platform features isolated input Amplifiers, built-in data storage devices, and accurate data measurement and capture. The measured data can be displayed on the PC screen or on the dedicated monitor, depending on the configuration selected. When connected to a PC, the DM3100 can be used as a PC measurement device; if you connect it to the display monitor, it can be used as a standalone unit.

Data transfer capabilities that lessen the load on your PC and LAN.

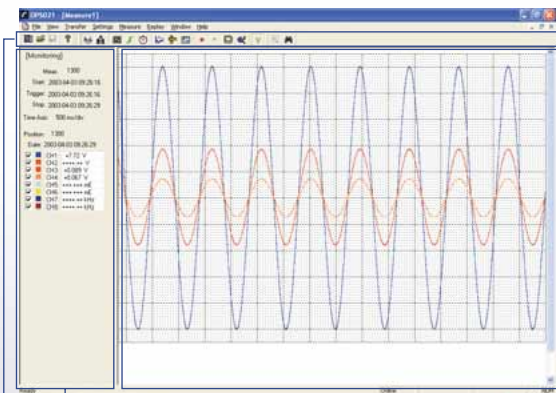
The DM3100's data storage capabilities enable smooth transfer of large volumes of data to minimize the processing load on your computer and to overcome the limitations of your Ethernet LAN communication

- Measurement flow 1** Data is transferred to the PC when the internal RAM becomes full.
- Measurement flow 2** Data is sent as compressed data to the PC while it is being captured to the hard disk or the PCMCIA card. In addition, fully-sampled data captured to the various storage devices can be sent to the PC in either Online or Offline status after measurements have been completed.



Controller (PC) functions

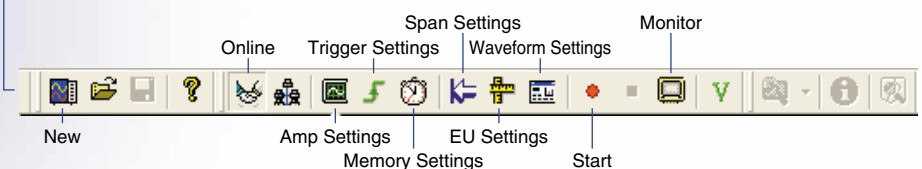
Main screen



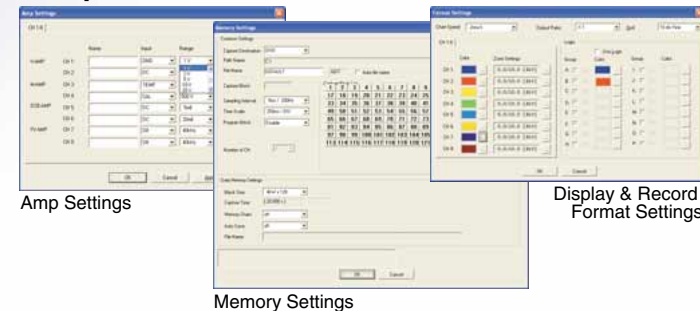
Waveform display area
Displays the measured waveform. The display color and display format can be changed for each channel. And, the background color and the grid can also be changed.

Information display area

Displays the time and measured data in a digital format.

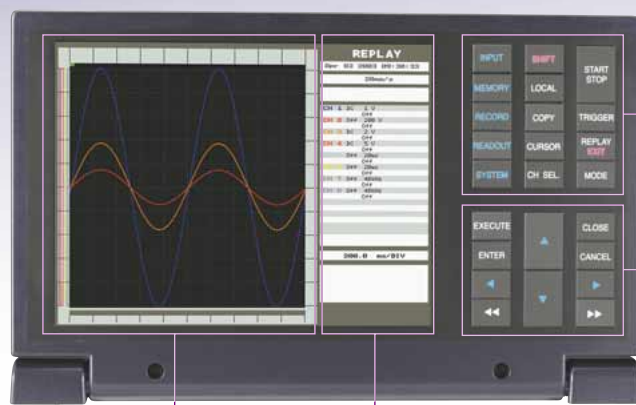


Setup Screens



Dedicated windows are provided to facilitate setups. The settings for each channel can be confirmed at a glance.

Monitor Dedicated Monitor Functions



Control / Menu Setup display keys

Other Setup keys

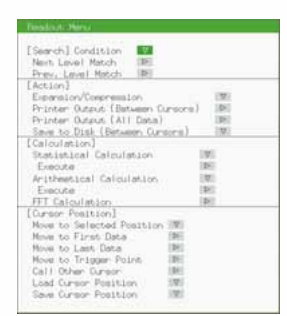
The dedicated monitor enables you to display measured waveforms and setup menus in full color, up to a maximum of 16 channels. The display format can be selected as "Scroll" or "Fixed"
Scroll: The measured waveform scrolls from the left to the right.
Fixed: The display is refreshed repeatedly within the screen area.

The sub-menu screen is used to display measured data in a digital format. The Window Help and Cursor Help windows are also displayed here.



Setup Screen

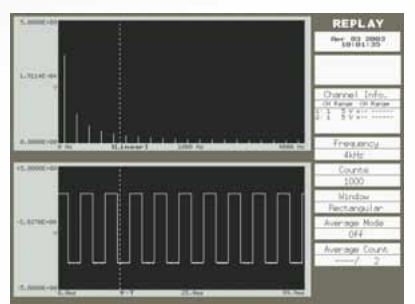
Dedicated menus facilitate the basic Input, Memory, Record, Readout, and System setups. Window Help and Cursor Help windows are also provided for when further clarification is needed.



Search Screen

The Cursor Display and Readout menus enable you to quickly locate only the data you need from all the data captured to memory. Select from the following search functions:

- Level search
- Date & time search
- Elapsed time search
- Position search



FFT Analysis

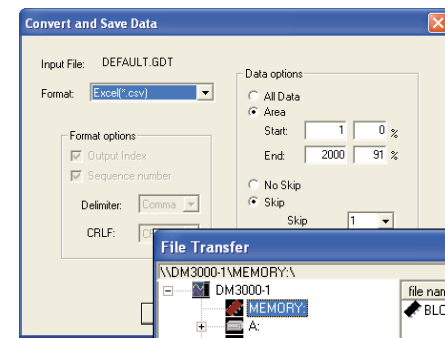
Use the monitor to perform FFT analysis on your captured data.

Printer

Record your waveforms on 100-mm wide chart paper.

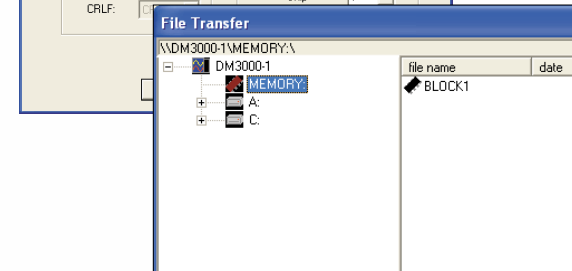


Additional Personal Computer Functions



File Conversion Function

Measured data can be converted into Excel or Text file formats. Select from three formats—Text, CSV, or DADISP—to suit your application.



File Transfer Function

Manage your measured data files. The data files stored in the DM3100 are displayed, and then transferred to the PC. In addition, data captured to the DM3100 can be copied or moved to another storage device.

Perfect for All Your Data Capture Requirements—Automobile Tests, Construction Industry, Testing Labs

The design concept of the DM3100 was “Perform Data Capture & Measurement with Just This One Device”. We have prepared a wide range of components such as sensors, a hard disk drive, a monitor, and software to assist you with integrating a customized data capture system for your specific measurement needs.

DATA PLATFORM MANAGEMENT

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Engine Performance Tests

A wide range of amplifiers is provided to suit your measurement targets. With the large-capacity disk drive, you can capture data right from the start of measurement, not just from when an irregularity occurs.



Chassis Tests

The standalone model, with its dedicated monitor, enables you to perform measurements and capture data to the built-in memory without the need to connect to a PC.



Environmental Tests

The DM3-M amplifier enables measurement of both voltage and temperature, and is ideal for performing environmental tests.



Strain Tests

Output from strain gauge sensors attached to buildings can be easily measured with the DM3-DCB amplifier.



General Specifications		
	DM3100-8	DM3100-16
Analog input	8 ch (4 slots)	16 ch (8 slots)
Logic input	8 ch	16 ch
PC interface	Ethernet (10 base-T/100 base-TX) USB (Ver 1.1)	
Internal memory devices	RAM, 512 kwords/ch (option: 1 Mword/ch) PCMCIA slot (Type 2) 40 Gbyte hard disk (option)	
Operating environment	0 to 40°C, 30 to 80% RH (5 to 35°C when using the hard disk and printer)	
Power supply	AC adapter (100 to 240 VAC)	AC adapter (100 to 240 VAC) x 2
Power consumption	Approx. 90 VA (max)* ¹	Approx. 135 VA (max)* ¹
External dimensions W x D x H, approx. (excluding rubber feet and protrusions)	300 x 222 x 57 mm	300 x 222 x 114 mm
Weight	Approx. 2.5 kg (including 4 amp units); excluding options and the AC adapter	Approx. 4 kg (including 8 amp units); excluding options and the AC adapters

*¹ Not including the printer (the printer's maximum power consumption is 80 VA)

Control Software Specifications		
Functions	Setting of measurement conditions, data measurement, file format conversion	
Operating environment	OS	Windows 2000, XP
	CPU	Pentium 4
	Memory	256 MB

Amp Unit Specifications

Voltage (DM3-V) Amplifier

Number of channels	2 channels/module
Input configuration	Floating ground with unbalanced-load input (each channel is independent)
Measurement range	50 mV to 200 V/FS
A/D converter	Sampling interval: 1 μ s; Resolution: 12 bits
Frequency response	DC to 200 kHz (+1/-3 dB Typ.)
Input filter	1.5, 5, 10, 50, 500 Hz, 5, 50 kHz

Voltage/Temperature (DM3-M) Amplifier

Number of channels	2 channels/module
Input configuration	Floating ground with unbalanced-load input (each channel is independent)
Measurement range	Voltage: 20 mV to 500 V/FS Thermocouples: K, J, T, R, E, B
A/D converter	Sampling interval: 10 μ s; Resolution: 16 bits
Frequency response	DC to 20 kHz (+1/-3 dB Typ.)
Input filter	1.5, 5, 10, 30, 50, 500 Hz, 5 kHz

DC Strain (DM3-DCB) Amplifier

Number of channels	2 channels/module
Input configuration	Floating ground with unbalanced-load input (each channel is independent)
Measurement range	1000 to 20,000 $\times 10^{-6}$ strain/FS
A/D converter	Sampling interval: 10 μ s; Resolution: 16 bits
Frequency response	DC to 20 kHz (+1/-3 dB Typ.)
Input filter	1.5, 5, 30, 100, 300 Hz, 1 kHz

F/V (DM3-FV) Amplifier

Number of channels	2 channels/module
Input configuration	Floating ground with unbalanced-load input (each channel is independent)
Measurement range	200 Hz to 40 kHz/FS
A/D converter	Sampling interval: 4 μ s; Resolution: 12 bits
Input filter	100 Hz, 1, 10 kHz (automatic ripple eliminating filter)

Logic Amplifier (B-503)

Number of channels	8 (4 channels/terminal x 2)
Input voltage range	0 to 25 V max. (single-ended ground)
Threshold levels	TTL (+1.4 V), CMOS (+2.5 V), Contact point (+5.0 V)
Sampling interval	1 μ s maximum

Note: The logic amplifier uses a dedicated slot, and cannot be replaced with another type of amplifier.



DM3-V amplifier



DM3-M amplifier



DM3-DCB amplifier



DM3-FV amplifier



LO amplifier (B-503)

Option Specifications

Monitor (B-501)

Display screen	8.4 inch color TFT
Items displayed	Menu setting screens, operating mode, measurement values

FFT Functions (optional monitor B-501 required)

Analysis functions	Auto-correlation: linear spectrum, power spectrum, power spectrum density, root-mean-square spectrum Cross-correlation: cross spectrum, transfer function, coherence function
Analysis frequency	400, 200, 100, 80, 40, 20, 10, 8, 5, 4, 2, 1 kHz; 800, 500, 400, 200, 100, 80, 50, 40, 20, 10, 8, 5 Hz; 4, 2, 1, 0.8, 0.5, 0.4, 0.2, 0.1, 0.08 Hz
Number of analysis channels	4
Window functions	Hanning and rectangular
Sampled points	1000 points; 2000 points
Averaging	Summation, Exponential, Peak Hold
Display formats	1 Division, 2 Divisions, 4 Divisions, Nyquist
Recording format	Hard copy of screen display

100-mm Printer (B-502)

Recording method	Thermal recording
Chart paper width	100 mm
Chart speed	25 mm/s maximum
Power supply	AC adapter (100 to 240 VAC)

12 V DC Drive (B-505)

Input voltage range	10 to 16 VDC
Power consumption	Approx. 150 VA

Hard disk (B-504)

Memory size	40 GB
Data capture speed	8 ms max (8 channels simultaneously*)
File capacity	Max. 2 GB per file
Number of files	Unlimited (within the 40 GB capacity)
Operating (swept sine) vibration	1 G (5-500 Hz), 2.0 oct/min sweep rate (0 to 55 Hz for the DM3100 main unit)

* May be limited by the amount of free space left on the hard disk

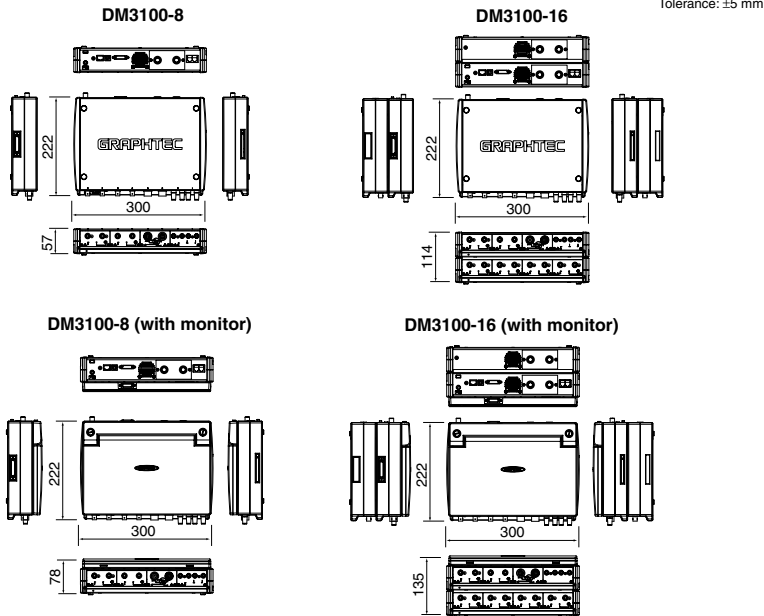
Unit Configuration

Unit name	Model name	Description	Remarks
8-channel main unit	DM3100-8	Channels 1 to 8; plug-in amps (maximum 4 slots)	Must be specified at time of initial order
16-channel main unit	DM3100-16	Channels 1 to 16; plug-in amps (maximum 8 slots)	Must be specified at time of initial order
Voltage amplifier	DM3-V amp	2 channels/module	Can be added at any time
Voltage/Temperature amplifier	DM3-M amp	2 channels/module	Can be added at any time
DC Strain amplifier	DM3-DCB amp	2 channels/module	Can be added at any time
Frequency-to-voltage conversion amplifier	DM3-FV amp	2 channels/module	Can be added at any time
Logic amplifier (two sets are required for DM3100-16)	B-503	8 channels/module	Can be added at any time
Monitor	B-501	8.4 inch color TFT display; connection cable to main unit (approx. 70 mm)	Can be added at any time
HDD	B-504	40 GB internal hard disk (max. file size: 2 GB)	Must be specified at time of initial order
Additional memory for DM3100-8	B-509	Increases internal RAM memory to 1 Mword per channel to 1 Mword per channel	Must be specified at time of initial order
Additional memory for DM3100-16	B-510	Increases internal RAM memory to 1 Mword per channel to 1 Mword per channel	Must be specified at time of initial order
12 VDC drive	B-505	DC power cord x 1; cables to connect the DC power adapter and the main unit x 3	Can be added later
100-mm printer	B-502	External thermal printer Chart width: 100 mm; max. chart speed: 25 mm/s	Can be added at any time
Monitor cable set	B-506	One 225-mm cable to mount the monitor at the front of the DM3100 unit; one 1-m cable for detached monitor use	Can be added at any time
Cable to connect main units together	B-508	Length: 140 mm	Can be added at any time
Report creation software	OPS-021		Can be added at any time

System Configurations

System Name	DPM Model Name	Description
PC Measurement DPM110 series	DPM112	4-channel PC-controlled Voltage Measurement
	DPM110	8-channel PC-controlled Voltage Measurement
	DPM111	16-channel PC-controlled Voltage Measurement
Digital Oscilloscope DPM210 series	DPM212	4-channel Standalone Voltage Measurement
	DPM210	8-channel Standalone Voltage Measurement
	DPM211	16-channel Standalone Voltage Measurement
PC-based Data Logger DPM310 series	DPM312-00	4-channel PC-controlled Temperature Measurement
	DPM310-00	8-channel PC-controlled Temperature Measurement
	DPM311-00	16-channel PC-controlled Temperature Measurement
	DPM312-10	4-channel PC-controlled Strain Measurement
	DPM310-10	8-channel PC-controlled Strain Measurement
	DPM311-10	16-channel PC-controlled Strain Measurement
Data Recorder & Logger DPM410 series	DPM412-00	4-channel Standalone Temperature Measurement
	DPM410-00	8-channel Standalone Temperature Measurement
	DPM411-00	16-channel Standalone Temperature Measurement
	DPM412-10	4-channel Standalone Strain Measurement
	DPM410-10	8-channel Standalone Strain Measurement
	DPM411-10	16-channel Standalone Strain Measurement

External Dimensions



- Graphtec shall not be held liable for any loss of data caused by a DM series product malfunction. Please be sure to make back-up copies of all your data.
- Brand names and product names are the trademarks or registered trademarks of their respective owners.
- The specifications in this brochure are correct as of May 25, 2003. Specifications are subject to change without notice. Please check Graphtec's website to obtain the latest specifications before placing your product order.



To ensure correct and safe use:

- Read your User's Manual before using the product, and operate it correctly in accordance with the procedures described.
- To prevent malfunctions or electrical shock due to current leakage, ensure that the product has a good protective ground, and ensure that the supply voltage conforms to the product power rating.

Accessories

CM105* Probe for Floating Voltage Input

Application	Checking relay coil voltage or the operational timing of voltage on/off from the control panel
No. of inputs	4 channels (floating for each channel)
Input range	High, Low
Input resistance	High: approx. 100 kΩ Low: approx. 50 kΩ
Detectable voltages	High: 100 to 250 VAC, 80 to 250 VDC Low: 50 to 150 VAC, 20 to 150 VDC
Non-detectable voltages	High: 0 to 20 VAC, 0 to 29 VDC Low: 0 to 10 VAC, 0 to 15 VDC
Response times	High: within 1 ms, Low: within 3 ms
Maximum floating voltage	250 VDC, AC-p

* Logic amp must be installed

CM106* Probe for Voltage Fluctuations

Application	Detection of momentary voltage drops of industrial power lines and waveform recording of those drops
No. of inputs	1
Input resistance	10 kΩ
Input range	100 VAC/120 VAC
Frequency range	Both 50/60 Hz
Voltage fluctuation detection level	±10%/±20%
Trigger output	Ch 1: detected at +10%, +20% Ch 2: detected at -10%, -20%
Detection method	Full-wave rectification, peak value detection
Response time	Approx. 1 cycle of the input AC voltage
Max. allowable input voltage	160 V rms

* Logic amp must be installed

Cables and cords

Name	Model number	Description	Remarks
2-pin banana-plug cables	B-378	RIC-115 set of 2 input cables	Bare tips
	B-336	RIC-115 set of 4 input cables	Bare tips
	B-331	RIC-115 set of 8 input cables	Bare tips
	B-335	RIC-115 set of 16 input cables	Bare tips
BNC-BNC cable	RIC-112	1.5 m	
BNC-Banana plug cable	RIC-113	1.5 m	
BNC-Alligator clip cable	RIC-114	1.5 m	

Clamp adapters, meters, and probes

Name	Model number	Description	Remarks
Clamp adapter	CM-102	Measures AC 0 to 1200 A	1 ch
Digital clamp meter	CM-111	Measures AC/DC current (0 to 2000 A), AC/DC voltage (0 to 1000 V), resistance (0 to 4,000 kΩ), frequency (0 to 4000 Hz), and temperature (-50 to +160°C)	
Line separator	CM-108	x1, x10	For use with CM-111
Temperature probe for clamp meter	RIC-110	-30 to +200°C	For use with CM-111
Logic IC cable	RIC-07	To connect RIC-08/09 with logic amp	
Alligator-clip cable	RIC-08	For use with logic amp	
IC-clip cable	RIC-09	For use with logic amp	
Probe set	RIC-10	One each of RIC-07, -08, -09	

Other

BNC conversion plugs	SMA-101 -4P	Banana to BNC, 4 per set	
Chart paper	PR-119	5 rolls/box	
Head cleaner set	B-368	Contains cleaning liquid and sheets	



GRAPHTEC CORPORATION

Western Graphtec Inc. • 11 Vanderbilt • Irvine • CA • 92618 • USA

Tel: 1 949-770-6010 • Toll-free 1 800-854-8385

Fax: 1 949-855-0895

Email: sales@graphtecusa.com

Web: www.westerngraphtec.com



Fujisawa Plant

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